

2. Remarks/Discussion of Issues

Claim Summary

By the present Amendment, claims 1, 2, 8-11, 14 and 22 have been amended to more clearly recite the claimed subject matter. Applicant notes the status of the present application as being an after final rejection and with respect to such status believe that there is a clear basis for the entry of the present amendment consistent with 37 C.F.R. § 1.116. Applicant submits that the revisions made to claims 1, 2, 8-11, 14 and 22 do not raise new issues requiring further search or consideration, but rather are clarifying in nature. It is also submitted that the present Amendment does not raise the question of new matter, and clearly places the present application in condition for allowance.

Claims 1-4, 7-11, 14-18 and 20-23 are pending in the application. Applicant respectfully submits that all pending claims are in condition for allowance.

35 U.S.C. § 112 Rejection - Claims 1-4, 7-11, 14-18 and 20-23

The Final Office Action of June 30, 2009, rejects claims 1-4, 7-11, 14-18 and 20-23 under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention, and specifically addresses independent claims 1, 8 and 15. *See* Final Office Action, p. 2.

By the present Amendment, claims 1, 8 and 15 have been revised to clarify the claimed subject matter, addressing the issues raised by the Examiner. Applicants submit that the rejection under 35 U.S.C. § 112, second paragraph, is therefore moot, and respectfully request withdrawal of the same.

35 U.S.C. § 102 Rejections - Claims 1-4, 7-11, 14-18 and 20-23

The Final Office Action of June 30, 2009, rejects claims 1-4, 7-11, 14-18 and 20-23 under 35 U.S.C. § 102(b) as being anticipated by MOCHIZUKI (U.S. Patent No. 6,263,093). Applicant respectfully traverses the rejection for at least the reasons set forth herein.

Applicant relies at least on the following standards with regard to proper rejections

under 35 U.S.C. § 102. Notably, anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. *See, e.g., In re Paulsen*, 30 F.3d 1475, 31 USPQ2d 1671 (Fed. Cir. 1994); *In re Spada*, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990); *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983). Alternatively, anticipation requires that each and every element of the claimed invention be embodied in a single prior art device or practice. *See, e.g., Minnesota Min. & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992). For anticipation, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. *See, e.g., Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 1001 (Fed. Cir. 1991).

Applicant's silence on certain aspects of the rejection is by no means a concession as to their propriety. Rather, because the applied art fails to disclose at least one feature of the claims, for at least the reasons discussed below, Applicant respectfully submits that the rejections are improper and should be withdrawn.

Claims 1-4, 7-11, 14-18 and 20-23

Applicant notes that the Final Office Action does not address claims by claim number or specific claim elements. *See* Final Office Action, pp. 2-3. Rather, as in the previous Office Action (March 3, 2009), the Final Office Action merely provides a narrative of what is allegedly disclosed by MOCHIZUKI, leaving Applicant in the precarious position of having to surmise that which may be considered by the Examiner to disclose the various claim elements.

In the Response to Arguments, the Examiner specifically clarifies only that the interpolator (recited in claims 1 and 15) is assertedly disclosed by one or both of the line interpolation section 23 and the frame interpolation section 30. *See* Final Office Action, p. 4. However, as in the previous Office Action (March 3, 2009), there still is no discussion of the specific steps recited in the method claims (claims 8-14) or of the specific features recited in a number of dependent claims.

For example, claim 4 recites that interpolation includes “at least one of interpolating 2 three-dimensional volumes to 4 three-dimensional volumes, interpolating 3 three-dimensional volumes to 4 three-dimensional volumes and interpolating 3 three-dimensional volumes to 5 three-dimensional volumes,” and claim 18 similarly recites that the interpolation includes “at least one of interpolating 2 three-dimensional objects to 4 three-dimensional objects, interpolating 3 three-dimensional objects to 4 three-dimensional objects and interpolating 3 three-dimensional objects to 5 three-dimensional objects.” The Final Office Action rejects claims 4 and 18 without any discussion, and without pointing to any portion(s) of MOCHIZUKI assertedly disclosing these features. Also, claims 7 and 19 recite that the interpolation includes “at least one of straight line, parabolic, stepped, cubic, FIR (Finite Impulse Response) and IIR (Infinite Impulse Response) interpolation.” The Final Office Action rejects claims 7 and 20 without any discussion, and without pointing to any portion(s) of MOCHIZUKI assertedly disclosing these features. Clearly, such uncertainty places Applicant in the prejudicial position of having to base a reply on potentially incorrect assumptions.

Accordingly, Applicant respectfully submits that the rejection fails to comply with MPEP § 706 and 37 CFR § 1.104(c)(2), and that the Examiner therefore has not established a *prima facie* case of anticipation with respect to the claims. Applicant further submits that the rejection of claims 1-4, 7-11, 14-18 and 20-23 under 35 U.S.C. § 102(b) should be withdrawn. Further, in light of the failure of the Final Office Action to comply with MPEP § 706 and 37 CFR § 1.104(c)(2), if further rejections are provided in subsequent official communications, Applicant respectfully submits that such rejections cannot be made properly final.

Claim 1

Independent claim 1 recites, in part:

“... an interpolator that interpolates three-dimensional volumes derived from ultrasound image data to obtain at least one interpolated three-dimensional volume, providing up

sampled three-dimensional volumes; and a memory that stores at least one of the ultrasound image data and the up sampled three-dimensional volumes.”

The Final Office Action asserts that the “interpolator” is disclosed by the line interpolation section 23 and/or the frame interpolation section 30 in FIG. 1 of MOCHIZUKI. See Final Office Action, pp. 3-4. However, the line interpolation section 23 and the frame interpolation section 30 interpolate two-dimensional data, not three-dimensional volumes, as recited in claims 1. In particular, the line interpolation section 23 interpolates between two adjacent ultrasound beams within the scanning plane S (*see, e.g.*, col. 9, lines 31-39), and the frame interpolation section 30 interpolates between two adjacent scanning planes (*see, e.g.*, col. 10, lines 35-42). In other words, MOCHIZUKI discloses interpolating (two-dimensional) data before the three-dimensional volumes are derived.

In the Response to Arguments, the Final Office Action acknowledges that the line interpolation section 23 interpolates two-dimensional data, but asserts that it may be considered “3D image data because it is the data used to create 3D images from the 3D probe 10.” *See* Final Office Action, p. 4. However, claim 1 has been amended to remove reference to “three-dimensional ultrasound image data,” in order to clarify that the interpolator interpolates three-dimensional volumes to obtain at least one interpolated three-dimensional volume, providing up sampled three-dimensional volumes. That is, the interpolation is among the three-dimensional volumes themselves, and not among data from which the three-dimensional volumes are ultimately derived, as in MOCHIZUKI. MOCHIZUKI therefore does not disclose at least this feature.

Accordingly, for at least the reasons stated above, Applicant respectfully submits that claim 1 is allowable over MOCHIZUKI, and requests withdrawal of the rejection of claim 1 under 35 U.S.C. § 102(b).

Claim 8

Independent claim 8 recites, in part:

" ... creating up sampled ultrasound image three-dimensional volumes from a plurality of three-dimensional volumes using interpolation; storing at least one of the three-dimensional volumes and the up sampled ultrasound image three-dimensional volumes; and rendering the up sampled ultrasound image three-dimensional volumes into display data, wherein creating the up sampled ultrasound image three-dimensional volumes comprises interpolating a the plurality of three-dimensional volumes derived from ultrasound image data to obtain at least one interpolated three-dimensional volume."

Applicant respectfully submits that MOCHIZUKI does not disclose each and every feature of claim 8, at least for substantially the same reasons discussed above with respect to claim 1. Accordingly, Applicant submits that claim 8 is allowable over MOCHIZUKI, and requests withdrawal of the rejection of claim 8 under 35 U.S.C. § 102(b).

Claim 15

Independent claim 15 recites, in part:

" ... an interpolator that interpolates three-dimensional objects derived from three-dimensional coordinates of ultrasound image data to obtain at least one interpolated three-dimensional object, providing up sampled three-dimensional objects; and a memory that stores at least one of the three-dimensional ultrasound image data and the up sampled three-dimensional objects."

Claim 15 recites interpolation of three-dimensional objects derived from three-dimensional coordinates of ultrasound image data to obtain at least one interpolated three-dimensional object, rather than three-dimensional volumes derived from three-dimensional ultrasound image data, as recited in claim 1. *See, e.g.*, Specification, p. 5, lines 5-19. However, as discussed above with respect to claim 1, MOCHIZUKI similarly does not disclose interpolation of three-dimensional objects. Rather, the line interpolation section 23 interpolates between two adjacent ultrasound beams within the scanning plane S (*see, e.g.*,

col. 9, lines 31-39), and the frame interpolation section 30 interpolates between two adjacent scanning planes (*see, e.g.*, col. 10, lines 35-42). Beams within a scanning plane and scanning planes are two dimensional, and which would precede formation of any three-dimensional objects.

Accordingly, for at least the reasons stated above, Applicant respectfully submits that claim 15 is allowable over MOCHIZUKI, and requests withdrawal of the rejection of claim 15 under 35 U.S.C. § 102(b).

Claims 2-4, 7, 9-11, 14, 16-18 and 20-23

With regard to claims 2-4, 7, 9-11, 14, 16-18 and 20-23, Applicant asserts that they are allowable at least because they depend, directly or indirectly, from independent claims 1, 8 and 15, respectively, which Applicant submits have been shown to be allowable over MOCHIZUKI, as well as in view of their additional recitations.

For example, as discussed above, claims 4 and 11 recite that interpolation of the three-dimensional volumes includes interpolating 2 three-dimensional volumes to 4 three-dimensional volumes, interpolating 3 three-dimensional volumes to 4 three-dimensional volumes and interpolating 3 three-dimensional volumes to 5 three-dimensional volumes. Claim 15 similarly recites that interpolation of the three-dimensional objects includes at least one of interpolating 2 three-dimensional objects to 4 three-dimensional objects, interpolating 3 three-dimensional objects to 4 three-dimensional objects and interpolating 3 three-dimensional objects to 5 three-dimensional objects. Applicant respectfully submits that MOCHIZUKI does not disclose performing such interpolations. For example, FIG. 1 of MOCHIZUKI shows line interpolation section 23 performing interpolation of two beams to generate one additional (interpolated) beam. The Examiner has not addressed this argument in the Final Office Action.

Conclusion

In view of the foregoing explanations, Applicant respectfully requests that the Examiner reconsider and reexamine the present application, allow claims 1-4, 7-11, 14-18 and

20-23 and pass the application to issue.

In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Van C. Ernest (Reg. No. 44,099) at (571) 283.0720 to discuss these matters.

Respectfully submitted on behalf of:

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